



U.S. Department of Commerce
Patent and Trademark Office
Assistant Commissioner of Patents
Technology Center 3600
2451 Crystal Drive, Arlington VA

FAX COVER SHEET

To: LARRY CULLEM

From: SANDRA SNAPP

Fax: 202.756.8087

Art Unit: 3624

Serial No.: 09/522,709

Date: 3.29.04

CC:

Phone No.: 703.305.6940

Urgent

☐ For Review

☐ Please Comment

☐ Please Reply

☒ Per Your Request

● Comments:

Number of Pages 7, including this page.

STATEMENT OF CONFIDENTIALITY

This facsimile transmission is an official U.S. Government document that may contain information that is privileged and/or confidential. It is intended only for use of the recipient named above. If you are not the intended recipient, any dissemination, distribution or copying of this document is strictly prohibited. If this document is received in error, you are requested to immediately notify the sender at the above indicated telephone number and return the entire document in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231.

3/10/00

CLAIMS

neural networks?

WHAT IS CLAIMED IS:

- 1 1. A method for managing risk in a market related to a commodity delivered over a
 2 network, comprising the steps of:
 - 3 modeling locational prices of the commodity in the market as a linear combination of
 4 congestion prices for congestible lines in the network; and
 5 producing a combination of price risk instruments for the market in a proportion such
 6 that an effect of the congestion prices for the congestible lines on the locational
 7 prices of the commodity is reduced.
- 1 2. The method according to claim 1, wherein the step of producing the combination
 2 of price risk instruments includes producing the combination in a proportion such that the
 3 effect of the congestion prices for the congestible lines on the locational prices of the
 4 commodity is eliminated.
- 1 3. The method according to claim 2, wherein the step of producing the combination
 2 includes selecting a portfolio y of price risk instruments, such that:
 3 $z'A - y'P'A = 0$,
 4 where A represents distribution factors describing the physics of power flows in
 5 the network, P represents the available market of price instruments, and z represents a
 6 market participant's underlying position in the market at a prospective time T .
- 1 4. A portfolio derived by the method according to claim 3.

101 -
lacks
tech analogy

lacks essential elements
112/ is method
or claim

1 (5.) A method for evaluating a portfolio of price risk instruments in a market related to
 2 a commodity delivered over a network, comprising the steps of:
 3 estimating a plurality of distribution factors indicating effects on one or more
 4 congestible lines in the network due to transfers of the commodity at respective
 5 locations in the network; and
 6 evaluating the portfolio based on the estimated distribution factors.

101 -
lacks
techn.

1 6. The method of claim 5, wherein the step of evaluating the portfolio includes the
 2 step of calculating a cost f based on the formula $f = (z'A - y'P'A)\lambda + y'F$, wherein:
 3 y represents the portfolio of price risk instruments;
 4 z represents underlying positions in the market at the prospective time;
 5 P represents a market of available price risk instruments;
 6 F represents prices for the available price risk instruments;
 7 A represents the distribution factors; and
 8 λ represents prices of congestion for the congestible lines;

1 (7.) A method for hedging a set of underlying positions at a prospective time in a
 2 market related to a commodity delivered over a network, comprising the steps of:
 3 estimating a plurality of distribution factors indicating effects on one or more
 4 congestible lines in the network due to transfers of the commodity at respective
 5 locations in the network; and
 6 producing ^a portfolio of price risk instruments for the market based on the estimated
 7 distribution factors.

no technology

1 8. The method for hedging according to claim 7, wherein the step of producing the
 2 portfolio includes the step of eliminating an effect of congestion prices for congestible
 3 lines on prices of the commodity at respective locations in the network.

1 9. The method according to claim 7, wherein the step of producing the portfolio
 2 includes selecting a portfolio y of price risk instruments, such that $z'A - y'P'A = 0$, where
 3 A represents the distribution factors, P represents the available market of price
 4 instruments, and z represents the underlying position.

11/2/2
 what about
 $z' y' P'$

1 10. A portfolio derived by the method according to claim 9.

1 (11) A method for identifying arbitrage opportunities among a plurality of available
 2 price risk instruments in a market related to a commodity delivered over a network,
 3 comprising the step of:
 4 estimating a plurality of distribution factors indicating effects on one or more
 5 congestible lines in the network due to transfers of the commodity at respective
 6 locations in the network; and
 7 producing a portfolio of price risk instruments from among the available price risk
 8 instruments based on the estimated distribution factors, wherein a number of the
 9 price risk instruments is greater than a number of the one or more congestible
 10 lines.

10/1 -
 lacks
 technology

1 12. The method according to claim 11, wherein the step of producing the portfolio
 2 includes selecting a portfolio y of price risk instruments, such that $y'P'A = 0$, where A
 3 represents the distribution factors, and P represents the available market of price
 4 instruments.

11/2/2

1 13. A portfolio derived by the method according to claim 12.

$y' P'$

1 (14) A method of identifying arbitrage opportunities among a plurality of available
 2 price risk instruments in a market related to a commodity delivered over a network,
 3 comprising the step of:
 4 modeling locational prices of the commodity in the market as a linear combination of
 5 congestion prices for congestible lines in the network; and
 6 producing a portfolio of price risk instruments from among the available price risk
 7 instruments in a proportion such that an effect of the congestion prices for the
 8 congestible lines on the locational prices of the commodity is eliminated, wherein
 9 a number of the price risk instruments is greater than a number of the one or more
 10 congestible lines.

101-
lacks
technology

1 15. The method according to claim 14, wherein the step of producing the portfolio
 2 includes selecting a portfolio y of price risk instruments, such that $y'P'A = 0$, where A
 3 represents the linear combination, and P represents the available market of price
 4 instruments.

11/2/2

1
y

1 16. A portfolio derived by the method according to claim 15.

1 (17) A computer-readable medium bearing instructions for managing risk in a market,
 2 related to a commodity delivered over a network, said instructions being arranged to
 3 cause one or more processors upon execution thereby to perform the steps of:
 4 modeling locational prices of the commodity in the market as a linear combination of
 5 congestion prices for congestible lines in the network; and
 6 producing a combination of price risk instruments for the market in a proportion such
 7 that an effect of the congestion prices for the congestible lines on the locational
 8 prices of the commodity is reduced.

00522709-031000

[illegible]

11/2 1
77. 2 4

[illegible]

METHOD FOR MANAGING RISK IN MARKETS RELATED TO COMMODITIES
DELIVERED OVER A NETWORK

ABSTRACT OF THE DISCLOSURE

5 A system, method, software, and portfolios for managing risk in markets relating
to a commodity delivered over a network are described, in which a market participant
constructs portfolios of preferably liquid price risk instruments in proportions that
eliminate the Spatial Price Risk for the market participant's underlying position.
Techniques are also disclosed for constructing and evaluating new price risk instruments
and other sets of positions, as well as identifying arbitrage opportunities in those markets.